prominent ridges. The interior is hollow, and the walls are composed of a few concentric layers without external enamel or cementum. The solid base to which it is attached is shallow, presenting smooth surface on the opposite side, which is deeply impressed by a longitudinal groove at one end.

The characters of this species are pointed out at the place above quoted. The measurements of a large specimen are: length .015; diameter of base, long .008; short .005.

I am not sure as to the part of the skeleton to which this body should be referred.

CLEPSYDROPS LIMBATUS sp. nov.

The discovery of a species of the genus *Clepsydrops* in Texas, in a formation hitherto regarded as Triassic, adds weight to the view above expressed, that the *Clepsydrops* shales of Illinois belong either to the Triassic or Permian formations. As typical of the new species I select a vertebra, which may be exactly compared with corresponding one of *C. collettii*. The centrum is about as wide as long, and its sides are very concave, much more so than in *C. collettii*, and the rim-like borders of the articular extremities are connected by a straight compressed hypopophysial keel. The sides of the foramen chordæ dorsalis are convex in the longitudinal section, thus contracting the opening, as compared with the very wide flare of the border of one of the extremities of the centrum. This flare receives the wide recurved border of the opposite extremity of the adjoining centrum, forming a kind of ball and socket articulation. This reflected surface forms a ridge with the funnel of the foramen at this extremity of the vertebra. The concave extremity is produced downwards, so that the foramen is considerably above the middle point. The diapophysis and parapophysis are not distinct nor elongate, but are represented by a projecting scar on the superior part of the centrum, which is directed downwards and forwards towards the rim of the articular face.

Besides the great contraction of the centrum, its relatively shorter form distinguishes it from that of *C. collettii*. It is also much larger than that species and the *C. pedunculatus*, being the largest of the genus.

Measurements.	M.
Length of centrum	.031
Diameter of centrum, vertical	.039
Diameter of centrum, transverse	.033
Width of neural canal	.006

Discovered by Jacob Boll.

On Reptilian remains from the Dakota Beds of Colorado.

By E. D. Cope.

(*Meeting of American Philosophical Society, November* 2, 1877.)

Since the discovery of the huge saurian *Camarasaurus supremus* (Cope, Paleontological Bulletin, No. 25, p. 5), Superintendent Lucas has explored

the horizon of the Dakota of the Eastern Rocky Mountains near the Arkansas River for other indications of extinct life. His search has been rewarded by the finding of several species of reptiles of interesting character, which it is the object of the present paper to describe.

CAULODON DIVERSIDENS gen. et. sp. nov.

This large saurian is represented by ten teeth found together, but separated from the cranial bones, and in a more or less broken condition. I select four of these exhibiting the characters most clearly.

Char. gen. Fang of the tooth of great length and hollow, and contracted at the base. It is without excavation for successional tooth. Crowns of the teeth of different forms in different portions of the jaw; the posterior are like the bowl of a spoon; others have a similar form but are more compressed, having double lateral ridges, while the crown of another, supposed to be an incisor, is little wider than the root, and has the section an oval with one side less convex than the other. All are coated with an enamel-like layer of considerable thickness which extends on the fang in some of the teeth. None of the crowns present cutting edges.

The characters presented by these teeth are quite distinct from anything hitherto found in North American Saurians. The absence of indication of the successional teeth is remarkable, and in connection with the contraction of the base of the root, suggests that the mode of succession of teeth approximated that exhibited by the *Mammalia*.

Char. specif.—The roots of all the teeth are cylindric. The crown of the posterior tooth is convex on one (the external) side, and concave on the other. The convexity is increased by a contraction of the external surface near and parallel to each border. The concavity is divided by a longitudinal rib which disappears at the base. This edge of the crown is obtuse, as is also the apex. The outline of the apex is rather broadly acuminate. The enamel is closely and strongly rugose, longitudinally on the base, transversely at the edges, and reticulately on the middle portions of the crown.

Measurements.	M.
Length of crown with portion of root	0.120
Diameter of root at middle	.025
Length of crown	.055
Diameter of crown { longitudinal	.030
Diameter of crown { transverse	.020

The crown of the second tooth is a little less expanded laterally, and has a greater transverse diameter. The outer side is more convex, and there are two marginal ribs on the basal half of the crown. The interior are not strictly marginal, but are situated within the exterior ribs. Both are very obtuse, and they are separated by a shallow groove. There is no median longitudinal rib.

Measurements.	M.
Diameter of crown at middle { antero posterior	.026
Diameter of crown at middle { transverse	.018

The third type is smaller in all its dimensions, and the crown is equal to the root in long diameter. In my single specimen the distal portion of the crown is lost; the part which remains exhibits neither contraction nor expansion of outline. The borders are very obtuse, and each surface resembles a roll inwards which is bounded by a shallow parallel groove on the inner face of the tooth. Between the grooves the surface is slightly convex. The section is thus an oval with one side very little convex. The enamel is thick and marked with longitudinal rugosities.

Measurements.	M.
Length of fragment	.060
" " root	.030
Diameter "	.014
Diameter of crown at middle, longitudinal	.0135
Diameter of crown at middle, transverse	.0085

TICHOSTEUS LUCASANUS, gen. et sp. nov.

Char. gen.—The characters of this genus are derived primarily from the vertebræ. They are nearly amphiplatyan, but one extremity of the articular face is slightly concave, while the other is still more slightly convex or concave. The borders of the former are expanded, while those of the latter are not enlarged. The centrum is hollow, but the chamber does not communicate with the external medium by a lateral foramen, as in *Camarasaurus*. The neural arch is attached by suture. There is no capitular articulation on the centrum.

Char. specif.—There is no hypapophysis on either dorsal or lumbar vertebræ preserved, and the surface is smooth excepting some delicate longitudinal ridges extending to the border of the expanded extremity. The narrower extremity of a dorsal vertebra is nearly round and presents a slight median tuberosity; the opposite end is wider than deep, and its surface is uniform. The smaller extremity of a lumbar vertebra is slightly concave.

Measurements.	M.
Diameter of dorsal centrum, longitudinal	.023
Diameter of dorsal centrum, vertical	.020
Diameter of dorsal centrum, transverse	.025
Width of base of neural arch with diapophysis	.010

This species is dedicated to its discoverer, O. W. Lucas, of Canyon City, Colorado, the Superintendent of the Public Schools of the surrounding region. Through the scientific interest and energy of this gentleman the extinct vertebrata of the Dakota division of the Cretaceous Period hitherto unknown to science are being brought to light. The care and skill exercised by Mr. Lucas in the preservation of remains, which are often bulky, and always fragile, deserve the thanks of all students of this department of science.

COMPSEMYS PLICATULUS, sp. nov.

Although tortoises have been discovered in older formations in Europe, the present species is the earliest yet obtained in North America. Its characters appear to coincide in important respects with those of the Lignitic formation which I have referred to *Compsemys* Leidy. This name I have proposed to retain for tortoises with marginal bones completely united with solid plastron, and the usual dermal scuta, and which differ from *Emys* in their Trionyx-like sculpture.

The *C. plicatulus* is represented by portions of both carapace and plastron of several individuals. While the distal extremities of the costal bones display the suture for the marginals, they also possess an inferior true costal prolongation, as in Trionyx. The proximal part is not preserved in any marginal bone, but the adjacent portions were united by fine suture. The proximal extremity of the costals exhibit the usual two directions, the shorter being posterior, and relating to the anterior part of the succeeding vertebral bone. The sternal sutures are fine; that between the hyo- and hyposternal bone is transverse; while that between the latter and the post-abdominal is oblique, and at the margin quite squamosal. At that point the hyosternal underlaps the post-abdominal for a considerable distance, and the suture of the inferior side of the plastron, after bending forwards, is abruptly recurved, running along the edge of the posterior lobe.

The scutal sutures are not wide nor deeply impressed, but the abdomino-femoral, and the femoro-anal are distinct. The median, longitudinal, sternal, and the costo-marginal sutures are irregular and serpentine. The sculpture is rather fine, and consists of rather closely placed tubercles and ridges. The borders of the elements of both carapace and plastron are marked with ridges at right angles to the sutures, which are not short. The middle parts of the costal bones are marked by short interrupted or inosculating vermicular ridges closely placed. On the middle portions of the sternal bones the ridges are in places more broken, forming tubercles.

The surface of the bridge is angularly oblique to that of the plastron. The buttresses are not produced inwards. The free marginal bones are rather thin, and are not recurved.

Measurements.	M.
Length of a costal bone	.110
Width of the same	.032
Thickness "	.005
Length of hyposternal bone	.066
Width of the same at inguinal notch	.048
Thickness of the same in front	.007

Found by Superintendent Lucas with the foregoing species.